Abstract Submitted
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Measurements of impurity concentrations and transport in the Lithium Tokamak Experiment[1] D.P. BOYLE, R.E. BELL, R. KAITA, M. LUCIA, J.C. SCHMITT, PPPL, F. SCOTTI, LLNL, S. KUBOTA, UCLA, C. HANSEN, U Washington, T.M. BIEWER, T.K. GRAY, ORNL — The Lithium Tokamak Experiment (LTX) is a modest-sized spherical tokamak with all-metal plasma facing components (PFCs), uniquely capable of operating with large area solid and/or liquid lithium coatings essentially surrounding the entire plasma. This work presents measurements of core plasma impurity concentrations and transport in LTX. In discharges with solid Li coatings, volume averaged impurity concentrations were low but non-negligible, with $\sim 2-4\%$ Li, $\sim 0.6-2\%$ C, $\sim 0.4-0.7\%$ O, and $Z_{eff} < 1.2$. Transport was assessed using the TRANSP, NCLASS, and MIST codes. Collisions with the main H ions dominated the neoclassical impurity transport, and neoclassical transport coefficients calculated with NCLASS were similar across all impurity species and differed no more than a factor of two. However, time-independent simulations with MIST indicated that neoclassical theory did not fully capture the impurity transport and anomalous transport likely played a significant role in determining impurity profiles. Progress on additional analysis, including time-dependent impurity transport simulations and impurity measurements with liquid lithium coatings, and plans for diagnostic upgrades and future experiments in LTX-β will also be presented.

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